Short Communication

Extension of the geographical range and notes on the diagnostic characters of *Canthium suberosum* (Rubiaceae — Vanguerieae)

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The known range of *Canthium suberosum* Codd, a species previously thought to have a rather limited distribution in the Transvaal and Swaziland, has been considerably extended. A comparative study of the anatomy of the leaves and young stems as well as the pollen morphology and fruit and seed structure prove that a putative new species from Natal and Pondoland is conspecific with *C. suberosum*.

Die bekende verspreidingsgebied van *Canthium suberosum* Codd, 'n spesie waaroor daar vroeër die mening bestaan het dat dit 'n redelik beperkte verspreiding in die Transvaal en Swaziland het, is aansienlik uitgebrei. 'n Vergelykende ondersoek van die anatomie van die blare en jong stingels asook die stuifmeelmorfologie en vrug- en saadstruktuur het aan die lig gebring dat 'n vermoedelik nuwe spesie uit Natal en Pondoland gelyksoortig met *C. suberosum* is.

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When a recent study on the comparative morphology and anatomy of *Canthium s.l.* in southern Africa (Tilney 1986) was initiated, a number of sterile specimens of uncertain identity from Natal and Pondoland were found in certain herbaria. These have subsequently been supplemented by fertile collections, thereby enabling an assessment of the taxonomic identity of this putative new species.

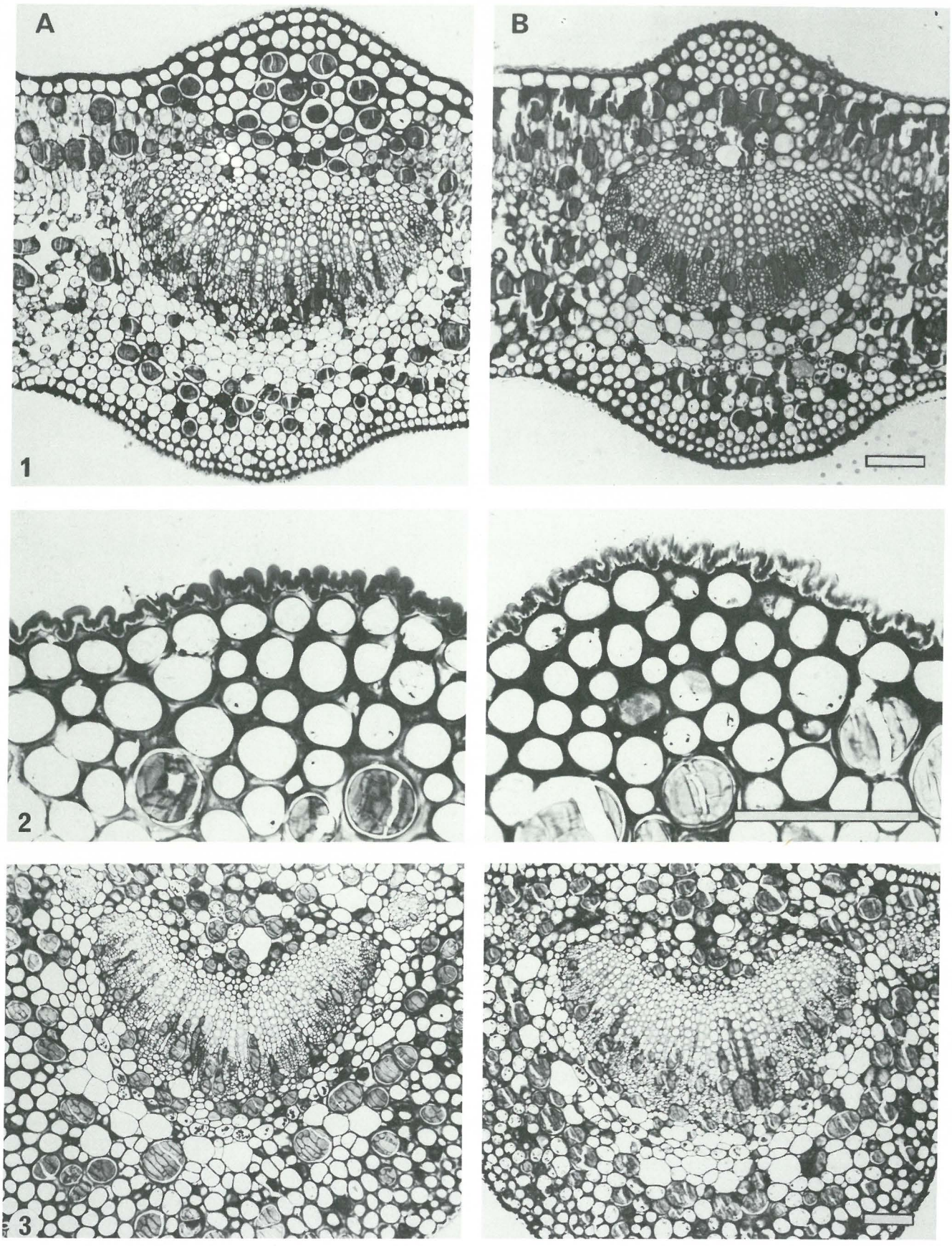
The first clue to the identity of the sterile material came from the anatomy. Tilney (1986) has shown that the particular type and distribution pattern of tanniniferous cells in the leaves and young stems are diagnostic for many of the southern African species of *Canthium s.l.* (for a proposed new generic delimitation of the latter see Bridson 1985). Material of the putative new species contains a particular kind of tanniniferous cell in numbers and distribution patterns similar to that in *C. inerme* (L.f) Kuntze and *C. suberosum* Codd (both *Canthium s. str.* sensu Bridson). Additional anatomical evidence showed the specimens from Natal and Pondoland to be similar in all significant features to that of *C. suberosum*, and to differ not only from *C. inerme* but also from all southern African members of *Canthium s. str.* These differences include prominent cuticular striae on the outer periclinal cell walls of the epidermal cells of the midrib, a very thick cuticle especially on the young stem, a relatively thick blade including the midrib, and phellem cells that are characteristically large and usually markedly anticlinally elongated in the youngest layers. The similarity between the unnamed Natal/Pondoland material and *C. suberosum*, particularly with regard to the aforementioned diagnostic features and the distribution pattern of the tanniniferous cells, is shown in Figures 1 – 5.

Strong support for the identification of the material in question as *C. suberosum* was also obtained from flowering and fruiting material. The subsessile flowers for example (Figure 6), are unlike any of the other species of *Canthium s. str.* in southern Africa. One of the most reliable diagnostic features for recognizing *C. suberosum* is the exceptionally large circular scar left by the calyx on the mature fruit (Figure 7). This feature, which is characteristic of only *C. suberosum*, has previously been recorded by Coates Palgrave (1977). Microscopically the fruits and seeds were found to agree to that of *C. suberosum* in all respects investigated, including the pericarp, seed-coat and endosperm (see Tilney 1986 for details). Noteworthy is the uniform distribution of tanniniferous cells throughout the pericarp, a feature encountered in only a few species, including *C. suberosum*.

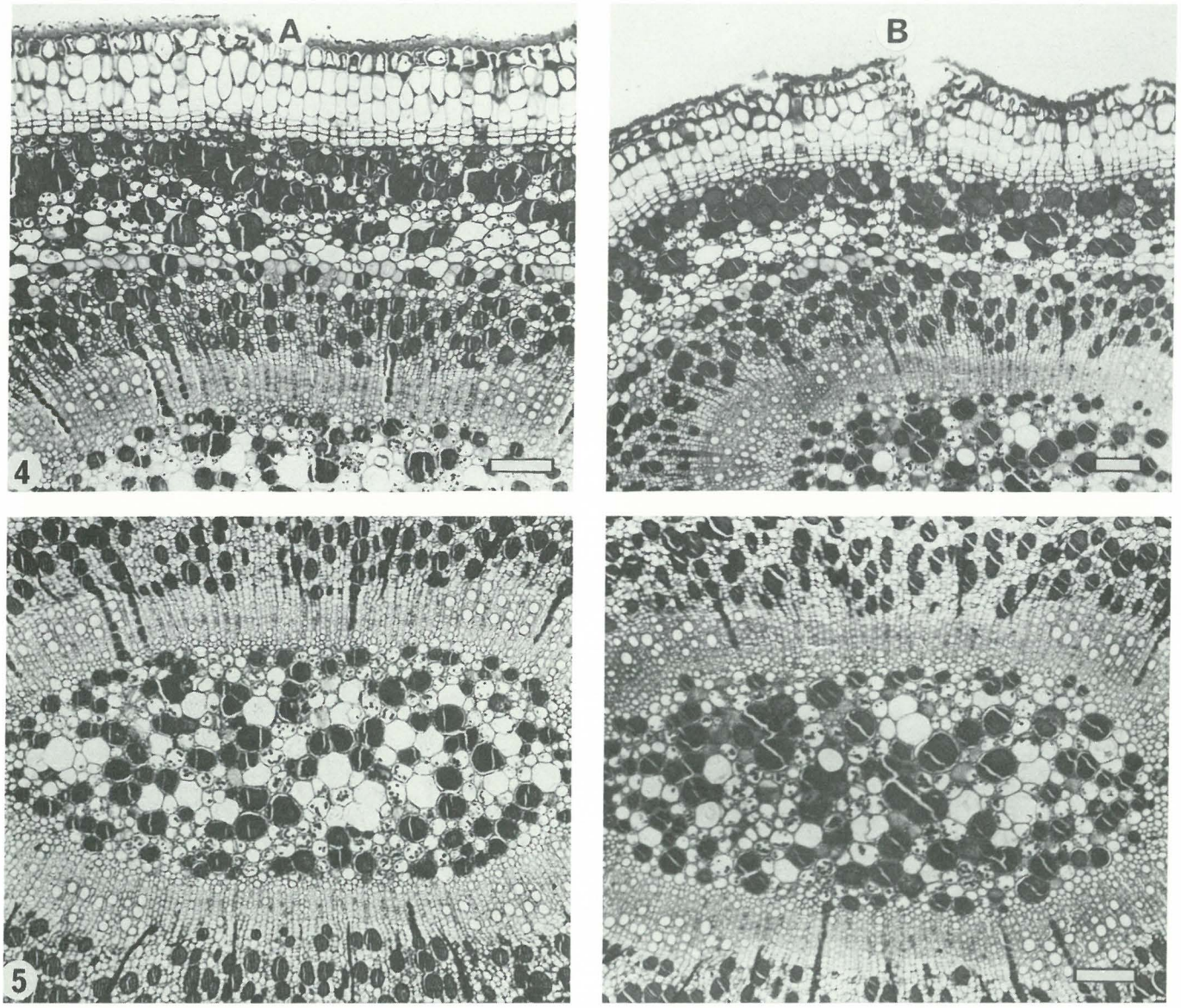
The pollen morphology is similar in *C. suberosum* and the material from Natal and Pondoland (Tilney 1986). However, this is not unexpected since pollen features are similar in most of the southern African members of *Canthium s. str.* Therefore it neither refutes nor supports the taxonomic placement.

On the strength of available evidence the putative new species from Natal and Pondoland is proposed to be conspecific with *C. suberosum*. The latter was described by Codd (1967) from material collected in central and southern Transvaal, as well as a single gathering from Swaziland. Additional diagnostic characters for the species include branchlets with an erect habit and thick, relatively short internodes and more conspicuously thickened nodes, bark on young branchlets often pinkish-brown and powdery, becoming cracked into a somewhat rectangular network with age — the old trunks often being markedly corky, leaves erect, often greyish-green, leathery, elliptic to oblanceolate-obovate with base cuneate and apex obtuse to rounded and inflorescences few-flowered and subsessile. Some of these features are illustrated in Figure 6. The findings of the present study are in line with those of Codd (1967) who stated that, on morphological grounds, *C. suberosum* and *C. inerme* are closely related. For a detailed comparison of these two species Tilney (1986) may be consulted.

Hitherto *C. suberosum* has been considered confined to an area extending from Pietersburg in the north to Pretoria in the south with outlier populations in the Suikerbosrand near Heidelberg (Transvaal) and in Swaziland. With the evidence presented here the range of the species is now also extended to Natal and Pondoland (Figure 8). Where *C. suberosum* occurs in the Transvaal it is generally uncommon and confined to small and widely scattered colonies. In Natal and Pondoland it is similarly a rare species. This sparse and widely scattered distribution suggest that it may be a relic of a previous wider distribution. It is particularly conspicuous in the sandstone region of southern Natal/Pondoland, a known centre of endemism which also harbours quite a number of rubiaceous species with more northerly distribution patterns or affinities e.g. *Psychotria capensis* (Eckl.) Vatke, *Rothmannia capensis* Thunb. and *Tricalysia lanceolata* (Sond.)



Figures 1 – 3 *Canthium suberosum* from the Transvaal (column A; from *Tilney 14*) compared with material of the same species from southern Natal (column B; from *Abbott 933*). Transverse sections of the leaf. **1.** Midrib of blade. **2.** Enlargement of tissues above midrib to show the convoluted (papillate) cuticular membrane. **3.** Petiole. Note abundant presence of tanniniferous cells displaying very similar patterns of arrangement in A and B. All sections from material embedded in GMA, stained with the periodic acid/Schiff's reaction and counterstained with toluidine blue. Scale bar = 100 μm.

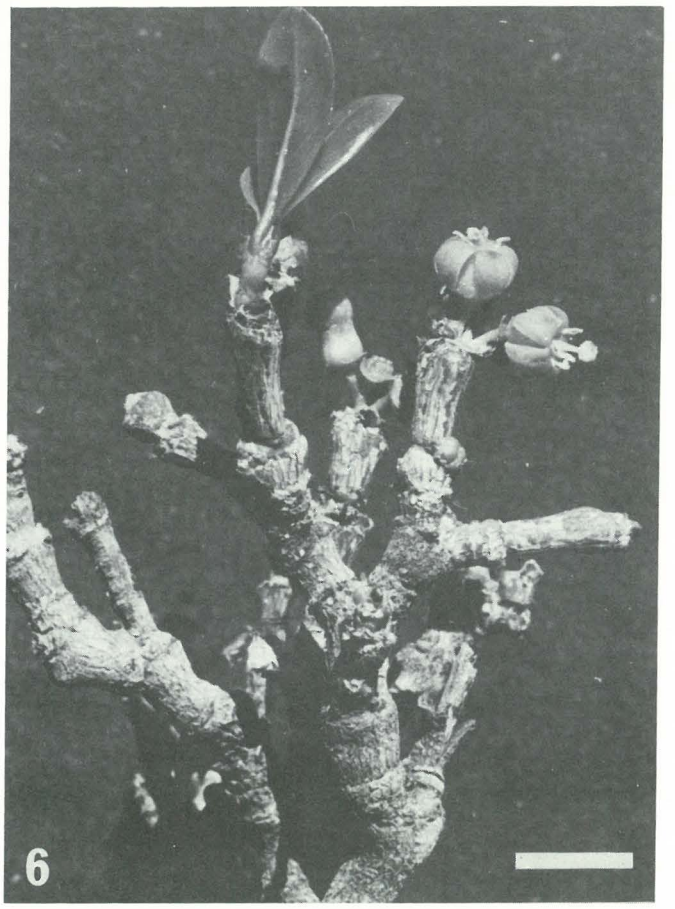


Figures 4 & 5 *Canthium suberosum* from the Transvaal (column A; from *Tilney 14*) compared with material of the same species from southern Natal (column B; from *Abbott 933*). Transverse sections of the stem. **4.** Outer tissue layers showing the subepidermal periderm with radially elongated phellem cells. **5.** Pith with surrounding xylem and phloem. Note abundant presence of tanniniferous cells displaying very similar patterns of arrangement in A and B. For preparation of sections see caption Figures 1 – 3. Scale bar = 100 µm.

Burtt Davy. An extreme example is *Tricalysia africana* (Sim) Robbrecht, a Pondoland endemic separated by a very wide interval from its presumed Guineo – Congolian relatives (Robbrecht 1985).

Specimens examined

—**2329** (Pietersburg): Between Boyne and Ashmore Dales (– DD), *Codd 10399* (PRE).
—**2428** (Nylstroom): 6 miles south of Vaalwater (– AC), *Burger 69* (PRE); Geelhout Kop (– AD), *Mogg 24495* (PRE); Between Potgietersrus and Palala (– BB), *Pole Evans s.n.* (PRE).
—**2429** (Zebediela): Grootvlei farm, Potgietersrus district (– AA), *Van der Helde s.n.* (PRE); Subiaco Mission (– BA), *Gerstner 5565* (PRE); Molepo Reserve, Subiaco, P.O. Boyne (– BA), *Gerstner 5346* (PRE).
—**2430** (Pilgrim's Rest): Schoonoord, Sekukuniland district (– CA), *Van Warmelo 78* (PRE).
—**2527** (Rustenburg): Rustenburg Nature Reserve (– CA), *Jacobsen 1063* (PRE); Breedtsnek (– CD), *Tilney 14* (PRU), *Vahrmeijer 1751, 1820* (all PRE); Buffelspoort Dam (– CD), *Venter s.n.* (PRE); Jacksonstuin (– DA), *Codd 6804* (PRE), *Mogg 23538* (PRE), *Theron 2589* (PRE, PRU), *Van Vuuren 275* (PRE), *Van Wyk 267* (PRE); Between Hekpoort and Maricana (– DC), *Botha 716* (PRE); Castle Gorge (– DC), *Botha 2065* (PRE), Hekpoort (– DC), *Cohen 456* (PRE); Rustenburg/Brits (– DC), *Meeuse 9257* (PRE); Elandskraal, Hekpoort, Castle Gorge (– DC), *Van Wyk 125* (PRU).
—**2628** (Johannesburg): Heidelberg Kloof (– AD), *Mogg 20473* (PRE).
—**2631** (Mbabane): Hlatikulu (– CD), *Compton 28157* (PRE).
—**2831** (Nkandla): Ngoye forest (– DC), *Abbott 2678* (PRU), *Lowrey & Van Wyk 1027, 1039, 1046* (all PRU).
—**3030** (Port Shepstone): Vernon Crooke's Nature Reserve (– BC), *Nichols 531* (NH, PRE); Umtamvuna Nature Reserve (UNR), Crocodile (– CC), *Abbott 1182* (PRU); UNR, Devil's Backbone (– CC), *Abbott 1468* (PRU); UNR, north forest margin of Gogosa Kloof (– CC), *Abbott 1369, 1370* (all PRU); UNR, Smedmore Forest (– CC), *Abbott 446* (PRU), UNR, *Puff 84082321* (PRE).
—**3129** (Port St Johns): Ntsubane, Fraser's Gorge (– BC), *Van Wyk & Kok 5865* (PRU); Mkambati Nature Reserve, Mkambati River (– BD), *Schrire, Van Wyk & Abbott 1803* (NH, PRU).
—**3130** (Port Edward): UNR, east margin of forest at the north of Bulolo Height (– AA), *Abbott 933* (PRU); UNR, Amphitheatre (– AA), *Abbott 1875* (PRU).



Figures 6 & 7 *Canthium suberosum*. **6.** Flowering branchlet; note the relatively short thick internodes and thickened nodes, cracked bark and subsessile, few-flowered inflorescence (*Tilney 14*). **7.** Fruit; note large circular scar left by the calyx on the mature fruit (*Lowrey & Van Wyk 1039*). Scale bar = 15 mm in Figure 6 & 2 mm in Figure 7.

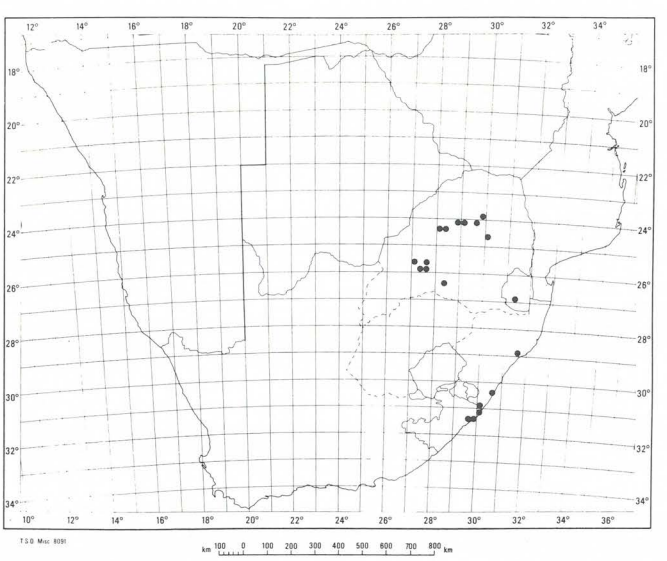


Figure 8 The known geographical distribution of *Canthium suberosum*.

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